

Appl. No. 10/635,637

Amdt. dated May 6, 2005

Reply to Office Action of Feb. 10, 2005

Amendments to the Specification:

Please replace paragraphs [0035], [0037], [0043], [0075] and [0076] with the following amended paragraphs:

[0035] In order to provide an efficient compressive seal having reduced risks of delaminating during thermal cycling, the present invention proposes the use of a chain of material CTEs that includes the CTE of the intermediate component. The use of an intermediate component having a predetermined CTE allows for localized CTE management with reduced risks of inducing stress on the optical component. The CTE of the optical fiber is chosen so as to be not greater than the CTE of the sealing material and the CTE of the sealing material is chosen so as to be not greater than than the CTE of the structure surrounding the sealing material, in this case, the intermediate component instead of the housing.

[0037] The use of an intermediate component having a CTE greater ~~then~~ than that of the housing and positioned so as to surround the sealing material hence allows for the creation of a seal using a chain of CTE preventing delaminating during thermal cycling but without requiring a high sealing material melting temperature that could potentially damage some optical components during packaging of the latter. The use of an intermediate component having a CTE greater ~~then~~ than that of the housing also allows for the creation of a relatively seal-tight compressive joint at the interface between the intermediate component and the housing.

[0043] In accordance with the present invention, there is also provided an optical component packaging device for protectively enclosing an optical component optically coupled to a strip of optical fiber, the strip of optical fiber defining a fiber longitudinal axis, the strip of optical fiber being made of an optical fiber material defining an optical fiber coefficient of thermal expansion, the strip of optical fiber including a fiber core surrounded by a fiber cladding coated

with a protective jacket, the strip of optical fiber defining a fiber outer surface; the optical component packaging device comprising: a housing, the housing defining a housing peripheral wall encompassing a housing inner volume, the housing peripheral wall having a housing aperture extending therethrough and leading into the housing inner volume, the housing being made of a housing material defining a housing coefficient of thermal expansion; an intermediate component, the intermediate component being substantially sealingly attached to the housing so as to cover the housing aperture, the intermediate component being made of an intermediate component material defining an intermediate component coefficient of thermal expansion, the intermediate component being provided with a generally encompassing intermediate component channel extending therethrough, the intermediate component channel defining an intermediate channel inner surface and an intermediate channel longitudinal axis; the housing aperture and the intermediate component channel being in communication with each other so as to allow the strip of optical fiber to extend from a position located inside the housing inner volume to a position located outside the packaging device; a sealing component in sealing contact with the intermediate channel inner surface, the sealing component being made of a sealing component material defining a sealing component coefficient of thermal expansion; the intermediate component coefficient of thermal expansion being greater ~~then~~ than the sealing component coefficient of thermal expansion; whereby, the sealing component is in sealing contact with both the fiber outer surface and the intermediate channel inner surface, the sealing contact of the sealing component with both the fiber outer surface and the intermediate channel inner surface being facilitated by the relationship between the sealing component, the intermediate component and the optical component coefficients of thermal expansion.

[0075] Preferably, the intermediate component coefficient of thermal expansion is greater or at least equal to the sealing component coefficient of thermal expansion that, in turn, is greater or at least equal to the optical fiber coefficient of thermal expansion. Typically, when the intermediate component coefficient of thermal expansion is equal to the sealing component coefficient of thermal expansion, the latter is, in turn, greater than the optical fiber coefficient of thermal expansion. Typically, when the intermediate component coefficient of thermal

expansion is greater ~~then~~ than the sealing component coefficient of thermal expansion, the latter is, in turn, greater or at least equal to the optical fiber coefficient of thermal expansion.

[0076] It should however be understood that the sealing component coefficient of thermal expansion could alternatively be smaller ~~then~~ than the intermediate component coefficient of thermal expansion without departing from the scope of the present invention. In such situations however, the geometry of the sealing component and of the intermediate component is preferably designed so that the effective change in the space occupied by the sealing component is greater than the change produced by the sealing material coefficient of thermal expansion. In other words, in such situations, the geometry of the sealing and intermediate components is such that it compensates for a lesser change in sealing component volume during thermal cycling so as to still facilitate the formation of a seal-tight interface.